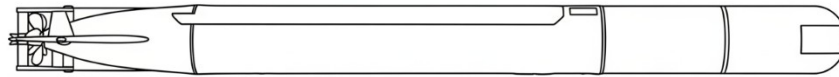


Azhdar (Dragon) UUV



Iranian Unmanned Underwater Vehicle — One-Way Attack / Mobile Mine

[IMAGE: Azhdar UUV — IRGC parade imagery or open-source analysis illustration; DVIDS / Covert Shores / H.I. Sutton]

Unit Cost (est.): Unknown — estimated low tens of thousands of dollars based on COTS components and SDV conversion origin | Cost Exchange Ratio vs. Mark 48 torpedo: estimated 50:1 to 100:1 in attacker's favor [VERIFY]

IDENTITY & DESIGNATION

Official Designation: Azhdar (Persian: Dragon) — IRGC/IRIN designation; no NATO designation assigned

Manufacturer: Islamic Revolutionary Guard Corps Navy (IRGCN) — indigenous development; derived from e-Ghavasi swimmer delivery vehicle (SDV)

Country of Origin: Iran

Year Introduced: Believed operational circa 2019; possible first combat use May 12, 2019 (Fujairah tanker attacks) [VERIFY]

Program Origin: Repurposing of existing e-Ghavasi human torpedo-type SDV as autonomous weaponized UUV; low-cost conversion using commercial off-the-shelf (COTS) navigation and sensor components

Operators: Islamic Revolutionary Guard Corps Navy (IRGCN); possible transfer to Houthi proxies — UUV components seized from Iranian dhow by US Coast Guard February 2024

CLASSIFICATION

Domain: Subsurface (UUV — Unmanned Underwater Vehicle)

Category: Military / One-Way Attack / Mobile Mine

Sub-Category: Autonomous underwater vehicle — functions as mobile mine, semi-autonomous torpedo, or persistent surveillance platform depending on mission configuration

Terminal Mode: Expendable — detonates on contact, magnetic influence, time, or sensor trigger

Expendable: Yes

Size Class: Torpedo-tube compatible — 533mm diameter; heavyweight torpedo form factor

PHYSICAL SPECIFICATIONS

Diameter: 533 mm — compatible with standard heavyweight torpedo tubes; allows submarine launch from Ghadir-class and Kilo-class vessels

Length: Approximately 6-8 meters [VERIFY] — derived from e-Ghavasi SDV hull form

Propulsion System: Lithium-ion electric battery — 50V system; near-silent acoustic signature

Warhead / Payload: Up to 480 kg cargo bay capacity; configured as multi-influence seabed mine or direct-attack warhead; estimated operational warhead approximately 200 kg [VERIFY]

Diving Planes: Forward planes and rear stabilizers recess into hull for torpedo tube compatibility; spring-loaded deployment post-launch

Hull Form: Torpedo / human torpedo (SDV) lineage — cylindrical with folding control surfaces

PROPULSION & PERFORMANCE

Propulsion Type: Electric — lithium-ion battery pack; brushless motor drive; no acoustic signature comparable to thermal torpedo or diesel propulsion

Max Speed: 18-25 knots (active pursuit mode)

Patrol / Loiter Speed: Low — approximately 3-6 knots for maximum endurance

Endurance (Active): Approximately 20 hours at operational speed; 127 km range in active mode [VERIFY — FICINT-sourced]

Endurance (Patrol/Loiter): Up to 24-96 hours at reduced speed; standby mode reportedly extends to 4 days [VERIFY]

Operating Depth: Up to 200 meters; Persian Gulf average depth 50 meters — shallow water operations primary mission profile

Max Range: 127-600 km depending on speed profile and endurance mode [VERIFY — significant source variance]

GUIDANCE, NAVIGATION & CONTROL

Navigation: Inertial navigation system (INS) — COTS accelerometers and gyroscopes acquired via shell companies and sanctions evasion networks

Targeting Modes: Programmable detonation: time-delay, GPS position, magnetic influence (hull signature), acoustic trigger, contact fuze

Autonomy Level: Semi-autonomous — pre-programmed mission; limited real-time targeting adaptation; can loiter and wait for sensor trigger without operator input

Communications: Underwater acoustic modem — limited; primarily fire-and-forget after deployment

GPS Dependency: Low — INS primary; GPS used for initial positioning and waypoint navigation where available

Man-in-Loop Required: No — fully autonomous terminal engagement once deployed; operator sets mission parameters pre-launch

Launch Platforms: Surface vessels; Ghadir-class midget submarines; Kilo-class submarines; possibly diver/SDV deployment

SENSORS & PAYLOADS

Primary Sensors: Marine magnetometer (hull magnetic signature detection); electro-hydraulic pressure sensors; acoustic sensors — all harvested from existing Iranian mine inventory

Optical: Possible short-mast EO/IR observation capability reported — allows limited target verification before detonation [VERIFY]

Mine Integration: Sensor suite directly integrated from Iran's existing floating, moored, and bottom mine inventory — proven technology applied to mobile platform

Payload Flexibility: Modular cargo bay — mine, warhead, or ISR payload configurations reported

COUNTERMEASURE VULNERABILITY PROFILE

Acoustic Detection: VERY LOW — electric propulsion produces minimal acoustic signature; shallow Persian Gulf waters create significant sonar clutter masking the vehicle

Magnetic Detection: MODERATE — vehicle has magnetic signature; magnetic anomaly detection (MAD) possible but operationally challenging in shallow cluttered water

Mine Countermeasures: LOW effectiveness — standard minesweeping ineffective against mobile autonomous vehicle; immune to conventional MCM because it moves

Anti-Submarine Warfare: LOW effectiveness in shallow water — hull-mounted sonar on surface ships struggles in Persian Gulf depth and thermal conditions

Kinetic Intercept: VERY LOW — no practical air or surface intercept solution currently fielded for slow-moving subsurface UUV in contested shallow water

RF Jamming: LOW threat to vehicle — primarily autonomous INS navigation; limited RF exposure

Counter-UUV Systems: EMERGING — US Task Force 59 deploying unmanned surface vessels with sonar for UUV detection; no proven low-cost counter-UUV intercept solution yet fielded

Overall Vulnerability Rating: LOW — the defender's dilemma in the subsurface domain; no cheap intercept solution exists comparable to AGR-20 in the air domain

CRUISE MISSILE CONVERGENCE NOTES

The Azhdar represents the subsurface expression of the same cost-exchange asymmetry that defines the Shahed-136 in the air domain — with one critical difference: the defender has no AGR-20 equivalent underwater. There is no cheap intercept solution for a slow-moving, near-silent, autonomous underwater vehicle operating in shallow water. The primary kinetic response remains the Mark 48 torpedo at approximately one point five million dollars per shot — against a platform that likely costs tens of thousands of dollars to produce from repurposed commercial and military components. The convergence angle is equally significant. The Azhdar began as a swimmer delivery vehicle — a human transport. Iranian engineers removed the human, added COTS navigation and sensor components, integrated existing mine fuzing technology, and produced an autonomous weapon. That is the drone convergence thesis applied underwater: remove the crew from the design constraint set, add autonomy, and the cost collapses while the threat envelope expands. The 533mm diameter is the detail that naval planners find most alarming. Torpedo-tube compatibility means any Iranian submarine — Ghadir-class midget submarines, Kilo-class conventional submarines — becomes an Azhdar launch platform without modification. The launch event is indistinguishable from a torpedo launch until the weapon fails to arrive at torpedo speed. By the time the defender understands what was launched, the Azhdar is already running its slow, quiet approach profile toward the target.

ENGINEER'S NOTE: *The subsurface domain has the same cost-exchange asymmetry problem as the air domain — but nobody has solved the cheap intercept problem yet. In the air domain the AGR-20 at 22 thousand dollars inverts the ratio against the Shahed. Underwater there is no equivalent. The Mark 48 torpedo is the primary kinetic counter and it costs approximately one point five million dollars per shot. Against a platform derived from a swimmer delivery vehicle using a Raspberry Pi processor and COTS sensors acquired through sanctions-evasion networks, that ratio is catastrophically unfavorable for the defender. What makes this particularly difficult from an engineering standpoint is the shallow water environment. The Persian Gulf averages about 50 meters depth. Sonar performance in shallow water is severely degraded by thermal layers, biologics, shipping noise, and bottom reverberation. The acoustic signature of an electric-propulsion UUV running at 3-6 knots in that environment is essentially indistinguishable from background noise. You are looking for a quiet electric motor in a very noisy shallow sea. The mobile mine concept is the genuinely new capability here. A traditional mine sits on the bottom and waits. A mobile mine moves to the target. That mobility defeats conventional minesweeping entirely — you cannot sweep a lane clean if the mines can reposition. This is not a new idea — navies have studied mobile mines for decades — but Iran appears to be the first adversary to field one at operational scale using low-cost commercial components. That is a significant asymmetric capability and it is currently operating in one of the most strategically important bodies of water on the planet.*

OPERATIONAL HISTORY

May 12 2019 — Fujairah: Four oil tankers attacked while anchored off Port of Fujairah UAE — two Saudi, one Norwegian, one UAE. Official investigation attributed attacks to anonymous state actor using limpet mines. Analytical assessment suggests Azhdar UUVs deployed from

Ghadir-class submarines were responsible [VERIFY — not officially confirmed]

2019-2020 Persian Gulf: Multiple attacks on merchant ships at anchor in Persian Gulf attributed to low-tech Iranian OWA-UUVs and limpet mines — pattern consistent with Azhdar operational concept

February 2024 — Houthi Transfer: US Coast Guard seized UUV and USV components from Iranian dhow confirming Iran supplying underwater drone technology to Houthi proxies in Yemen

February 2024 — Red Sea: US Central Command confirmed first observed Houthi employment of a UUV — struck by US forces; confirms operational transfer of Iranian UUV technology to proxy forces

2025-2026 — Strait of Hormuz: Azhdar and related UUV systems cited as key component of Iranian sea-denial strategy in Strait of Hormuz; US Navy describes strait as Iranian kill box in part due to underwater drone threat

Production Rate: Estimated 2-3 vehicles per month based on Iranian defense industrial capacity assessment [VERIFY — FICINT-sourced estimate]

SOURCES & CROSS-REFERENCES

Primary Analysis: Strikepod Systems / David R. Strachan — FICINT assessment (fiction intelligence analytical tool): strikepod.com

RealClearDefense:

https://www.realcleardefense.com/articles/2019/10/28/alternative_history_an_assessment_of_the_islamic_revolutionary_guard_corps_navy_azhdar_unmanned_undersea_vehicle_114815.html

Covert Shores / H.I. Sutton: <https://www.hisutton.com/Iranian-Houthi-UUV-notes.html> — primary open-source silhouette and technical analysis

Defence Security Asia: Azhdar UUV Strait of Hormuz analysis — March 2026

FICINT Note: [IMPORTANT: Several detailed specifications including range, endurance, and production rate figures derive from FICINT (analytical fiction) sources. These are assessed estimates, not confirmed public disclosures. All such figures tagged [VERIFY]]

Cross-Ref: See also: Shahed-136 (air domain cost-exchange parallel); Mark 48 torpedo (primary US kinetic counter); IRGC OWA-UUV torpedo-

style drone (related platform); US Task Force 59 (counter-UUV effort);
Houthi USV/UUV program (proxy transfer)